DOCUMENT RESUME

ED 215 434 EA 014 575

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TITLE The Use of Monetary Reward as a Learning Incentive.
PUB DATE Mar 82
NOTE 21p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, March 19-23, 1982).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Career Education; Control Groups; *Cooperative Education; Disadvantaged Youth; *Employment Programs; Experimental Groups; Language Skills; Mathematics Achievement; Positive Reinforcement; Pretests Posttests; *Rewards; Secondary Education; Tables (Data); *Youth Programs
IDENTIFIERS *Monetary Incentives

ABSTRACT

Researchers used a pretest-posttest comparison to evaluate the effectiveness of monetary rewards in Project ALIVE (Atlantans Learning in a Vocational Environment), a nine-week summer program that combined education, employment, and career training for economically disadvantaged youth in grades 8-12. The project was jointly offered by the Atlanta (Georgia) Public Schools and the city's Comprehensive Employment and Training Act (CETA) office. An experimental group of 254 students was paid for both work and academic instruction each week. A control group of 220 students was was also paid for work but received no academic instruction. Using the Georgia Criterion-Referenced Tests, the researchers tested both groups before and after the project on 12 curriculum objectives in communication skills, mathematics, and career development skills. Test scores were analyzed using t-tests and Hotelling's T-squared. Results for 235 experimental and 136 control students revealed significantly better performance by the experimental group in mathematics and most career development skills but no significant differences in communication skills. The authors concluded that these results indicate Project ALIVE's monetary rewards helped improve student learning. Two appendices list the 12 curriculum objectives and present results on four additional performance criteria. (Author/RW)

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THE USE OF MONETARY REWARD AS A LEARNING INCENTIVE

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Paper presented at the Annual Meeting of the
American Educational Research Association, New York
New York, March 19-23, 1982.

EA 014 575

Abstract

This study addresses research findings emanating from an evaluation of Project ALIVE, a summer program for economically disadvantaged youth. Atlanta Public School students in grades 8 to 12 were engaged in a nine-week program which linked education, employment, and career training into a comprehensive learning experience. Experimental group students were paid $3.10 per hour for receiving both academic instruction and employment. Control group students received an equal rate of pay, but were involved only in employment. A posttest comparison of the two groups revealed significantly higher performance for the experimental group in computation and career development. There was no significant difference between the two groups with respect to communication skills.

The Use of Monetary Reward as a Learning Incentive

Introduction

It is commonly accepted that positive reinforcement enhances learning. However, methods for determining what the nature of that reinforcement should be, or which reinforcements function best for which learners continue to be complex issues. For those interested in long-term changes, an alternate concern is: To what extent can external reinforcements be used to activate an individual's personal desire to achieve a prescribed goal. The present study seeks to enhance an understanding of these issues and is directly linked to previous works which have sought to examine the relationship between intrinsic and extrinsic motivation.

Several views have been taken regarding the advisability of using material rewards, such as money, as an incentive for learning. Though Deci (1972) advocated the more traditional view of intrinsic and extrinsic motivation, his work has been criticized as demonstrating the inability of the inequity and self-perception theories of intrinsic motivation to deal with all possible task. Deci, however, stated that intrinsic motivation emanates from within the individual and extrinsic motivation originates external to the individual.

Other researchers (Kieffer and Goh, 1981; Lauridsen, 1978; Calder and Shaw, 1975; Kruglanski, Riter, Amitai, Margolin, Shabti, and Zaksh, 1975; and Forlano, 1936) have professed an alternate perspective. Lauridsen's research indicated that the

implementation of a reward system which parallels the American Economic System is an effective method for encouraging students with low motivation, disciplinary problems or learning disabilities to improve their performance. Forlano (1936), and Kieffer and Goh (1981) also found that tangible rewards can be used effectively as learning incentives.

The present study is perhaps more closely associated to that of Kruglanski et. al. (1975). They demonstrated that the traditional concepts of intrinsic and extrinsic motivation should be modified, since the distinguishing characteristic is not whether the cause of the action originates within or outside of the individual. The distinctive element is whether the external reward is preceived as an inherent component oi the task to be performed. Their results support the theory that if the extrinsic reward is characteristically associated with an activity, its presence enhances intrinsic motivation while its absence diminishes personal interest in the task.

The purpose of this study was to determine whether learning could be improved by placing academic instruction and employment in the same context. Specifically, the study focused upon the evaluation of the initial year of Project ALIVE, a Summer Youth Employment Program (SYEP) demonstration project which was jointly sponsored by the City of Atlanta's Comprehensive Employment and Training Act (CETA) office and the Atlanta Public Schools (APS).

Project ALIVE (Atlantans Learning in A Vocational Environment) had as its primary objective, the linkage of education, employment, and career training into a comprehensive learning experience which thereby responds to some of the critical needs arising from the

high unemployment rate among economically disadvantaged youth. The unique feature of the program was that students received direct payment for their educational training as well as their summer employment.

Methodology

Overview

The research design sought to assess differences between the experimental and control group using a pretest-posttest comparison of specific curriculum objectives in communication skills, computation (i.e., mathematics), and career development. These focal objectives were selected by the Project ALIVE staff based on 1979 results of the Georgia Criterion-Referenced Tests (GCRT) administered to APS eighth graders. There were 27 GCRT objectives on which the mastery level for Atlanta city students fell 15 percentage points or more below the mastery level of students in the metropolitan Atlanta area. The project staff selected the 12 instructional objectives for the program from this group (see Appendix A).

The initial program served 474 high school students in grades 8 through 12 and extended over a nine-week period (June 16, 1980, to August 15, 1980). APS students who completed the regular SYEP in-take process and agreed to participate in Project ALIVE were randomly assigned to either the experimental or the control group. The sample comprised 254 experimental group students and 220 control group students.

There were three critical differences between the two groups:

1. Experimental group students worked three eight-hour days at an assigned job site and were, thereby, given a better glimpse of the responsibilities associated with full-time employment. Control group students worked five half-days (i.e., four hours per day) at an assigned job site. Both groups were paid at a rate of $3.10 per hour.
2. Experimental group students received academic instructions in reading/language arts, mathematics and career development five hours per day for two days each week and were paid at the same rate received for employment. Control group students did not receive academic instruction.
3. Experimental group students who successfully completed the program received five hours of academic credit for Occupational English.

Procedure

The research design focused primarily upon a pretest-posttest comparison of the experimental and control groups with respect to the three curriculum areas. Both the pretest and posttest were based upon alternate forms of the GCRT and were comparable to portions of the state test. Test items were selected to ensure that the pretest and posttest represented alternate forms which assesed the same objectives. The pretest and posttest were administered to both experimental and control group students at the beginning and end of the program.

Data Analysis

The focal point of the evaluation is based upon a statistical analysis of the "hard" data; however, it is important to note that there was also a considerable analysis of "soft" data. "Hard" data focused upon the pretest and posttest scores. The students' mastery of career objectives, students' self ratings of their progress, as well as the ratings of counselors, supervisors and former teachers are the areas comprising the "soft" data. A presentation of much of this information is beyond the scope of this paper.

Two main strategies were used to measure the impact of Project ALIVE upon experimental group students. One method focused upon gains made by the experimental group between pretest and posttest administrations. The other method focused exclusively upon identifiable differences between the posttest performance of the experimental group and control group which might be attributable to Project ALIVE. Though the initial sample contained 254 experimental and 220 control students, the pretest-posttest comparison was conducted on those 235 experimental and 136 control students having both pretest and posttest scores.

The data was initially analyzed using a series of correlated and independent t tests, since these statistics were more readily understood by the audience to which the initial paper was directed. Recognizing that this approach lowers the significance level for the overall experiment, the data was also analyzed using the Hotelling's T^2.

The statistical analysis focused upon differences between the experimental and control groups with respect to four subtests:

1. Communication
2. Mathematics
3. Career 1
4. Career 2

The career 2 subtest differed from the other subtests in that it measured only one curriculum objective and was not included on the pretest.

A descriptive analysis of students' mastery of specific career development objectives was also conducted. No attempt was made to draw statistical inferences from these data. However, they provided useful information regarding several program objectives.

FINDINGS

Statistical Analysis

The results of both the independent t-tests (see Table 1) and the Hotelling's T^2 (see Table 2) indicated that the posttest means for experimental group students were significantly higher than those of the control group on the mathematics and the career 1 subtests. This significant difference ($p < .05$) occurred on the mathematics and career 1

subtest for both the independent t-tests and the Hotelling's T^2. No significance posttest differences were found between experimental and control group students with respect to the communication and career 2 subtests.

Table 1

Comparison Of Posttest Performance

Of Experimental And Control Groups

Subject	Experimental (N = 235) Mean	SD	Control (N = 136) Mean	SD	P
Communication	14.99	3.88	14.78	6.76	.74
Math	8.25	3.68	6.77	2.73	.00
Career 1	14.20	4.47	12.50	4.79	.00
Career 2	2.96	6.09	2.63	1.30	.43

TABLE 2

Hotelling's T^2 Analysis Of Posttest Performance For Experimental And Control Groups

Subject	Mean Difference*	95 Percent Confidence Interval
Communication	0.20788	-1.63482 to 2.05058
Mathematics	1.48641	0.27687 to 2.69595**
Career 1	1.69915	0.04842 to 3.34988**
Career 2	0.32528	-1.27303 to 1.92359

*Mean difference is the experimental posttest mean minus the control posttest mean.

**Indicates significance ($p < .05$).

Additional analysis was performed on the gain scores for the two groups using the Hotelling's T^2. These results further substantiated the previous analyses. The mean pretest-posttest gains made by experimental group students were significantly higher ($p < .05$) than those of the control group on the mathematics and career 1 (see Table 3). There was no significance difference between the gains made on the communication and career 2 subtests.

TABLE 3

Hotelling's T^2 Analysis Of Pretest-Posttest Gains
For Experimental And Control Groups

Subject	Mean Difference*	95 Percent Confidence Interval
Communication	0.09215	-1.33921 to 1.52351
Mathematics	1.34994	0.45268 to 2.24720**
Career 1	1.99524	0.83093 to 3.15955**
Career 2	0.54990	-1.06090 to 2.16070

*Mean difference is the mean score gain achieved by the experimental group minus the mean score gain achieved by the control group.

**Indicates significance ($p < .05$).

Descriptive Analysis

In addition to comparing the scores achieved by the experimental and control groups on the posttest, a further analysis was made of participants' mastery of specific career development objectives. An 80 percent criterion level was established. The descriptive analysis of the career objectives was performed because of their relationship to specific program objectives. The specific career objectives evaluated are listed below. Each refers to a selected objective on the GCRT (see Table 4).

Table 4

Target Georgia Criterion-Referenced Tests Objectives

Number	GCRT Career Objectives
2	The student recognizes how the ability to get along with people affects getting into, keeping, and advancing in a job (interpersonal relations).
3	The student recognizes how his personal characteristics may impede and/or facilitate work on the job.
11	The student will demonstrate knowledge or skills which are important in obtaining a job.
12	The student recognizes that he is influenced in some manner by every school subject area he encounters, and he has some knowledge of the application of subject matter to his everyday life, including his work.
18	The student recognizes the interdependency of immediate decisions and long-range goals.

Data regarding mastery of specific career objectives was compiled for a sample of both the experimental and control groups. The sample utilized in this analysis was a subsample of the experimental group (N=122), and contained all members of the control group (N=136) upon whom pretest and posttest mastery scores were computed.

An examination of the data indicates that there was an increase in the percentage of students who mastered career objectives 11, 12, and 18 in both the experimental and control groups. The converse was true for career objective 3. There was a decline in the percentage of students who mastered career objective 3 from pretesting to posttesting in

both groups. The performance for experimental group students declined less than that for control group students. There was no difference between the posttest mastery level of the experimental and control groups on career objective 2 (see Table 5).

Table 5

Percentage Of Experimental and Control Groups Demonstrating Posttest Mastery Of Career Development Objectives

GCRT Objective Number	Experimental (N = 122)			Control (N = 136)		
	Pre	Post	Gain	Pre	Post	Gain
2	—	28	—	—	28	—
3	66	52	-14	48	30	-18
11	60	84	+24	63	69	+6
12	32	59	+27	33	48	+15
18	32	46	+14	26	35	+9

Discussion

Conclusions regarding the study's findings are presented in three major categories: (1) data which relate to the program objectives as outlined in the contract; (2) data regarding the performance standards later appended to the contract (see Appendix B); and (3) data regarding additional information used in assessing the program's effectiveness.

Program objectives are listed below:

1. To examine the effectiveness of providing 250 experimental group youth with full-time employment in conjunction with intensified training in basic skills and career development.
2. To provide 250 control group youth with job and labor market information only and compare the posttest performance of these students to that of the experimental group in order to determine whether there were any significant differences between the two groups.
3. To increase the reading, language and computational skills of 250 experimental group participants by providing intensive instruction in these areas, and to compare these areas with those of control group participants.
4. To increase 250 experimental group participants' understanding of the relationship between education and qualification experience by providing career development training.
5. To increase 250 experimental group participants' understanding of the relationship between immediate decisions and long-range goals by providing training in decision-making skills.

6. To increase 250 participants' understanding of the importance of attitudes and personal traits in holding a job by providing instruction in attitude and behavior standards.

The career 1 subtest assessed students' mastery of four of the five GCRT career objectives stressed by the program. The posttest performance of experimental group students was significantly higher than that of the control group students. In fact, there was a greater difference between the scores for the two groups in this category than in any other instructional area.

Experimental group students had higher posttest scores on the career 2 subtests. Their scores, however, were not significantly higher than the posttest scores achieved by the control group students. The career 2 subtest assessed students' mastery of one GCRT career objective. This five-item subtest probably did not provide a large enought item pool from which experimental group students could achieve a mean score which was above the chance level.

Experimental group students performed significantly better than control group students in mathematics, though, there was no significant difference between the performance of the two groups in communication. The differences in the performance of experimental group students in these two areas may be due to the fact that the mathematics objectives were finite and the reading objectives tended to be more abstract. Possibly, it was easier to remediate students' weaknesses in math because the curriculum objectives stressed were clear and distinct. The instructional guideposts needed to assist students in communication are probably more complex, less concrete and perhaps more difficult to master in a short-term remediation program.

The ultimate assessment of students' performance on program objectives 4, 5, and 6 will be demonstrated by their success in the profession of their choice. Comparisons made between the experimental and control groups with respect to these program objectives must, therefore, be qualified. The fact that the experimental group had a greater increase in the percentage of students who mastered the GCRT career objectives tends to indicate an increased cognitive awareness. This heightened awareness may not however, be translated into a change of behavior.

The increase in the percentage of students mastering the career objectives for both the experimental and control groups tends to indicate that there are elements inherent in the work experience which were the same for both groups. These elements may enhance students' awareness of the linkage between their immediate actions and a future vocation.

Summary

The comparison of scores attained on the Project ALIVE Pretest and Posttest revealed that experimental group students displayed significantly higher performance than the control group on the mathematics and career 1 subtests. However, there was no significant difference between the performance of the two groups on the communication and career 2 subtests.

In addition to comparing the raw scores achieved by the experimental and control groups on the posttest, a further analysis was made of participants' mastery of specific career development objectives. An 80 percent criterion level was established. Experimental group students performed better than control group students on four of the five career objectives.

In general, the overall success of this program revealed that monetary reward, if used in an appropriate context, can serve as an effective incentive for learning. Experimental group students' improvement in both cognitive and affective domains indicated that the monetary reward was a useful tool in improving students' basic skills and increasing their awareness of the symbiotic relationship between school and world of work.

References

Calder, B. J., & Shaw, B. M. Interaction of intrinsic and extrinsic motivation: Some methodological notes. Journal of Personality and Social Psychology, 1975, 31, 76-83. (a)

Calder, B. J. & Shaw, B. M. Self-perception of intrinsic and extrinsic motivation. Journal of Personality and Social Psychology, 1975, 31, 599-605. (b)

Coleman, T. R. Motivational workshop for low achieving students in order to help them improve career maturity. San Francisco: R & E Research Associates, 1978.

Deci, E. L. Intrinsic motivation, extrinsic reinforcement and inequality. Journal of Personality and Social Psychology, 1972, 22, (1), 113-120.

Ferrin, R. I., & Arbeiter, S. Bridging the gap: A study of education-to-work linkages. New York: College Entrance Examination Board, 1975.

Forlano, G. School learning with various methods of practice and rewards. New York: Bureau of Publication, Teachers College, Columbia University, 1936.

Kieffer, D. A., & Goh, D. S. Effects of individually contracted incentives on intelligence test performance of middle-and-low SES children. Journal of Clinical Psychology, 1981, 37, 175-179.

Kruglanski, A. W., Riter, A., Amitai, A., Margolin, B. S., Shabai, L., and Zaksh, D. Can money enhance intrinsic motivation? A test of the content-consequence hypothesis. Journal of Personality and Social Psychology, 1975, 31 (4), 744-750.

Lauridsen, D. The token economy system. Englewood Cliffs, New Jersey: Educational Technology Publications, 1978.

Appendix A

PROJECT ALIVE

CURRICULUM OBJECTIVES

Reading	Objective
7	Uses a dictionary for selecting appropriate word meaning, finding synonyms, and finding antonyms.
8	Uses the table of contents and the index to locate specific information in a textbook or a reference book.
11	Reads newspaper articles and advertisements and determines which statements are facts and which are the author's opinions or preferences.
19	Distinguishes between sentence fragments and complete sentences and combines two or more sentences to form a single sentence.
Mathematics	
2	Uses numerical forms (fractional parts, equivalent fractions, decimal approximations) of rational numbers.
4	Selects appropriate arithmetic operations.
6	Adds, subtracts, multiplies by 3-digit numbers and divides by 2-digit numbers; computes with simple and decimal fractions, integers, and percents.
Career Development	
2	The student recognizes how the ability to get along with people affects getting into, keeping, and advancing in a job (interpersonal relations).
3	The student recognizes how his personal characteristics may impede and/or facilitate work on the job.
11	The student will demonstrate knowledge or skills which are important in obtaining a job.
12	The student recognizes that he is influenced in some manner by every school subject area he encounters, and he has some knowledge of the application of subject matter to his everyday life, including his work.
18	The student recognizes the interdependency of immediate decisions and long-range goals.

Appendix B

Four performance criteria were appended to the Project ALIVE contract and served as an additional standard for measuring the success of the program. The four contract performance standards are discussed below.

Contract Performance Standard 1:

A minimum of 85 percent of the experimental participants will meet the attendance requirements.

Discussion:

The criteria for this performance standard were that each experimental group student was to be in attendance and punctual for 75 percent of all scheduled activities. At the conclusion of the project period, 88.9 percent of the participants met or exceeded these criteria.

Conclusion:

The standard was exceeded.

Contract Performance Standard 2:

A minimum of 65 percent of the experimental group participants will demonstrate improved academic performance by showing favorable growth in basic skills as a result of their participation in Project ALIVE.

Discussion:

When pretest and posttest scores were compared, 79.1 percent of the experimental group participants showed higher posttest scores.

Conclusion:

The standard was exceeded.

Contract Performance Standard 3:

A minimum of 80 percent of the experimental participants will master 85 percent of the employability skills as evaluated by the career education teachers' ratings in the career education component of Project ALIVE.

Discussion:

Based on records of pupils' employability skills which were an integral part of career education, 87.2 per cent of the participants mastered the skills. These skills included completing application forms, job hunting, interview techniques, etc. and other skills considered essential by staff.

Conclusion:

The standard was exceeded.

Contract Performance Standard 4:

A minimum of 100 per cent of the Atlanta Public Schools' experimental group participants completing the project will receive academic credit.

Discussion:

All experimental group participants from Atlanta Public Schools received five hours credit in Occupational English.

Conclusion:

The standard was met.